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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants :	Alexander E. Gash et al	Docket No. :	IL-10781B
Serial No. :	10/626,098	Art Unit :	
Filed :	July 23, 2003	Examiner	Henry H.
For :	Inorganic Metal Oxide/Organic Polymer Nanocomposites and Method Thereof		

**CERTIFICATE OF MAILING BY "FIRST CLASS MAIL"**

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*Teresa Walls*  
Teresa Walls

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Alexandria, VA 22313-1450

Dear Sir:

Prior to examination, please amend the above-identified patent application in the following manner.

The invention claimed is

[0001] 1. (Currently Amended) A nanocomposite produced by the process comprising:

dissolving a metal ion salt in a solvent system to form a metal ion salt solution, wherein said solvent system is common to said metal ion salt and a polymer;

adding an epoxide to said metal ion salt solution to form an epoxide-containing metal ion salt solution;

dissolving said polymer in said solvent system to form a polymer solution;

adding a portion of the polymer solution to the polymer-containing metal ion salt solution to form a polymer-containing, epoxide-containing metal ion salt solution; and

stirring said a polymer-containing, epoxide-containing metal ion salt solution until said solution gels.

[0002] 2. (Currently Amended) The nanocomposite produced by the process recited in Claim 10 1, further comprising:

adding a fuel metal powder to said polymer-containing, epoxide-containing metal ion salt solution while stirring, wherein said addition of the fuel metal powder occurs before said polymer-containing, epoxide-containing metal ion salt solution gels.

[0003] 3. (Currently Amended) The nanocomposite recited in Claim 10 1, wherein said metal oxide is Fe<sub>2</sub>O<sub>3</sub>.

[0004] 4. (Currently Amended) The nanocomposite produced by the process recited in Claim 10 1, wherein said polymer is a fluoroelastomer.

[0005] 5. (Currently Amended) The nanocomposite produced by the process recited in Claim 11 2, wherein said fluoroelastomer is Viton®A, A-100.

[0006] 6. (Currently Amended) The nanocomposite produced by the process recited in Claim 10 1, wherein Viton®A, A-100 is soluble in said solvent system.

[0007] 7. (Currently Amended) The nanocomposite produced by the process recited in Claim 10 1, wherein said solvent system is a mixture of ethanol and acetone.

[0008] 8. (Currently Amended) The nanocomposite produced by the process recited in Claim 11 2, wherein said fuel metal powder is Al, Mg, B, Ti, Zr or mixtures thereof.

[0009] 9. (Currently Amended) The nanocomposite produced by the process recited in Claim 11 2, wherein said fuel metal powder is ultra fine grain aluminum.

[0010] 10. (Currently Amended) A nanocomposite comprising:  
an inorganic sol-gel polymer phase comprising at least one metal-oxide and at least one epoxide; and  
an interpenetrating organic polymer phase entwined in said inorganic sol-gel phase.

[00011] 11. (Currently Amended) The nanocomposite recited in Claim 19 10, wherein said inorganic sol-gel polymer phase further comprises:

A fuel metal powder.

[00012] 12. (Currently Amended) The nanocomposite recited in Claim 19 10, wherein said metal oxide is Fe<sub>2</sub>O<sub>3</sub>.

[00013] 13. (Currently Amended) The nanocomposite recited in Claim 19 10, wherein said polymer is a fluoroelastomer.

[00014] 14. (Currently Amended) The nanocomposite recited in Claim 22 13, wherein said fluoroelastomer is Viton®A, A-100.

[00015] 15. (Currently Amended) The nanocomposite recited in Claim 20 11, wherein said fuel metal powder is Al, Mg, B, Ti, Zr or mixtures thereof.

[00016] 16. (Currently Amended) The nanocomposite recited in Claim 20 11, wherein said fuel metal powder is ultra fine grain aluminum.

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Lawrence Livermore National Laboratory  
Office of Laboratory Counsel/Patent Group

**FAX:** (925) 423-2231

**Mail Address:**

**VERIFY:** (925) 422-7273

7000 East Avenue  
P.O. Box 808, L-703  
Livermore, CA 94550

OFFICIAL

**DATE:** May 4, 2004

**FROM:** Ann Lee **TELEPHONE NO.:** (925) 422-6458

**TO:** Henry Hu **Fax:** 703-872-9306

**REGARDING:**

IL-10781B

"Inorganic Metal Oxide/Organic Polymer Nanocomposites and Method Thereof"

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Henry,

This is also being put in the mail by Express Mail today 5-4-2004.

Thank you

Teresa Walls  
Patent Administrator

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